

Louisiana Environmental Protection and Sustainability Pathway Development Recommendations

Overview

Louisiana has an opportunity to create Environmental Protection and Sustainability career pathways that target regional needs and specific ecosystems across the state. Known as the sportsman's paradise, Louisiana offers a wide range of environmental and species management opportunities that can be used to entice students as they engage in rich course work that truly blends science, technology, engineering and math content and skills. Opportunities to build structured career pathways in the southern region of the state should include a focus on coastal land and wildlife management. This focus would engage students in better understanding the ecosystems of the marshes, wetlands and open water areas along the coast and exploring environmental problems ranging from conservation and coastal restoration to supporting the region's food economy through wildlife and fisheries management. In the northern region of the state, students should have opportunities to explore wetlands, forests and wildlife with a focus on safeguarding the environment and the habitat of countless birds and mammals and studying invasive species.

SREB offers five recommendations to develop regional EPS pathways, based on these data:

- A detailed labor market analysis that included employment data gathered from the Louisiana Workforce Commission and Jobs EQ, which analyses labor market conditions.
- A summary of current EPS-related postsecondary program offerings at two-year and four-year institutions in the state.
- Input provided by postsecondary representatives who support EPS-related programs.

Recommendation 1: Assemble a design team to develop regional EPS pathways that align with SREB's elements of quality career pathways.

State partners — including the Louisiana Department of Education, the Board of Regents and the LaSTEM Council — should focus on developing an EPS-related career pathway system that builds bridges from high school to postsecondary education and the workplace. In part through the work of its [Commission on Career and Technical Education](#), SREB has identified the following elements of rigorous, relevant pathways that are driven by labor market demand.

Quality career pathways:

- Combine a college-ready academic core with challenging technical studies and require high school students to complete real-world assignments.
- Align three stages of learning — secondary, postsecondary and the workplace — through strategies like dual enrollment and work-based learning.
- Create guidance systems that include career information, exploration and advisement and engage students in ongoing career and college counseling beginning in the middle grades.

- Allow students to choose accelerated learning options in settings that provide the extended time needed to earn advanced industry credentials.
- Lead to further education and training and high-skill, high-wage jobs in high-demand industries.

Engage regional partners in developing at least two EPS-related pathways, one for the southern region that addresses the unique problems encountered in coastal parishes and one for the northern region that supports land and species management. Provide regional partners with the labor market data and postsecondary summaries resulting from the SREB study, as found in Appendix A of this report. Engage partners in reviewing prominent available occupations across each region. Determine if these occupations focus on land or resource management, including energy management, or technical skills. Depending on trends identified in the data, state partners have the opportunity to develop a natural science or physical science-focused sequence of courses. Table 1 summarizes occupations by region.

Table 1: List of Projected Occupations by Region

Occupational Title	Region Number							
	1	2	3	4	5	6	7	8
Civil Engineers	X	X	X	X	X	X	X	X
Electrical Engineers	X	X	X	X	X	X	X	
Mechanical Engineers	X	X		X			X	
Chemists				X	X		X	
Environmental Scientists and Specialists, Including Health	X	X		X			X	
Chemical Engineers	X	X			X			
Natural Sciences Managers	X	X			X			
Surveyors	X	X	X	X	X	X	X	
Environmental Engineers	X	X		X	X		X	
Architectural and Civil Drafters	X	X	X	X			X	X
Electrical and Electronics Drafters	X	X						
Civil Engineering Technicians	X	X		X	X	X	X	
Electrical and Electronics Engineering Technicians	X	X	X	X	X	X	X	X
Environmental Engineering Technicians	X	X		X				
Mechanical Engineering Technicians	X	X						
Surveying and Mapping Technicians	X	X	X	X	X	X	X	X
Soil and Plant Scientists	X					X		
Biological Technicians	X	X						
Chemical Technicians	X	X		X	X		X	
Environmental Science and Protection Technicians, Including Health		X		X	X	X	X	
Biological Science Teachers, Postsecondary	X							
Public Relations Specialists	X	X		X	X	X	X	X
Commercial Divers	X	X	X					

Occupational Title	Region Number							
	1	2	3	4	5	6	7	8
Power Plant Operators	X			X			X	
Geological and Petroleum Technicians	X							
Agricultural Inspectors	X	X						
Foresters							X	
Marine Engineers and Naval Architects	X		X					
Geoscientists, Except Hydrologists and Geographers	X	X		X			X	
Water and Wastewater Treatment Plant and System Operators	X	X	X	X	X	X	X	X
Conservation Scientists	X	X		X	X		X	
Materials Scientists					X			
Agricultural and Food Science Technicians		X						
Farmworkers, Farm, Ranch, and Aquacultural Animals	X					X		X
Forest and Conservation Workers							X	
Biological Scientists, All Other		X		X	X	X		X

Source: U.S. Bureau of Labor Statistics, Louisiana Workforce Commission and JobsEQ; see Appendix A (Excel).

As the state's partners review labor market data, encourage them to group related occupations, such as technicians, that would benefit from similar foundational courses or experiences. Use these groupings to prioritize the development of specific pathways.

Early in the design process, support regional partners in creating a stated vision for each pathway and identifying related goals and strategies for developing course sequences and learning activities.

Engage design partners in reviewing postsecondary feedback gathered in the spring of 2020. Use this information to determine the knowledge and skills needed for each related pathway. Postsecondary partners encouraged pathway designers to infuse rich science content throughout the pathway, both within the EPS course sequences to be developed and in required co-requisite science courses. Review the sample course sequences outlined in SREB's nine STEM-intensive [Advanced Career pathways](#). SREB's AC courses are taught in the context of a college-ready academic core. Each AC pathway is built upon a four-course sequence that begins with a broader overview of problems found within related pathway careers and narrowing to focus on key concepts and skills needed for continued learning and the attainment of credentials. Consider how those courses could be used as a foundation for the development of EPS related pathways. For example, Course 1 of SREB's [Innovations in Science and Technology Pathway](#) focuses on design principles needed by a vast array of engineering occupations listed in the labor market analysis. Courses within the [Clean Energy Technology Pathway](#) could be geared to focus on plant management and sustainable energy sources that are environmentally friendly. SREB's Oil and Gas pathway courses could be used as the foundation for understanding oil and gas production and later learning about oil spill response and conservation. All EPS pathway courses can be blended to support the unique occupations of each region. As partners work to identify needed skills, review current course offerings that

could be used as introductory courses. For example, introductory environmental science, engineering or agricultural courses could serve as the first course of each pathway sequence.

As course sequences are developed, the content provided in each must align with the targeted industry and postsecondary credentials that students earn upon completing the pathway. Use available credential blueprints to validate the key concepts taught within the pathway. Work with postsecondary representatives to align related programs.

A solid understanding of the essential academic and technical skills needed in each occupational area should guide the development of EPS programs. High school students in an EPS pathway should be enrolled in standards-based math, science and technical courses that align with these essential skills. Pathway design discussions should address accelerated and postsecondary learning opportunities for high school students, including:

- Which math courses will best prepare students to enroll in postsecondary studies and earn credentials valued by employers? These might include Algebra II, Calculus or Statistics, for example.
- Which science courses are most appropriate for a specific pathway? These might include Biology, Chemistry, Physics or Earth Science, for example.
- Which technical courses will best equip students to secure entry-level jobs and transition successfully to postsecondary programs? These might include Computer Science, Clean Energy Technology or Pre-Engineering, for example.
- Which postsecondary courses do students need to complete to earn credentials valued by industry?

Recommendation 2: Create opportunities for design team members to review and validate credentials of value.

Appendix B provides a current — as of the 2018 academic year — list of credentials and degrees awarded for each postsecondary institution as well as credentials of value for each occupational area.

Engage design teams in a review of postsecondary and credential data. Determine available credentials of value for proposed EPS pathways. Host discussions with postsecondary representatives, local businesses and state-based conservation groups to further explore the credentials of value that will help students enter into and progress up the career ladder. Table 2 lists the credentials currently available to high school students.

Table 2: Credentials Available for High School Students

Occupational Title	Related Credential
Electrical Engineer	National Center for Construction Education & Research Certification (NCCER)
Civil Engineering Technicians	OSHA 10
Commercial Divers	First Aid Certification Certification in Cardiopulmonary Resuscitation (CPR) Emergency Medical Technician (EMT)

Electrical and Electronics Drafters	Autodesk AutoCAD Microsoft Office Microsoft Excel
Electrical and Electronics Engineering Technicians	OSHA 30 CompTIA Network+ Certification
Environmental Science and Protection Technicians, Including Health	Certified Forester (CF) OSHA 30
Natural Sciences Managers	Basic Life Support (BLS) First Aid Certification Certification in Cardiopulmonary Resuscitation (CPR)
Forest and Conservation Technicians	Certification in Cardiopulmonary Resuscitation (CPR) First Aid Certification

Source: JobsEQ data; see Appendix B.

Use Table 2 to identify credentials that can serve as a first step in a set of stackable credentials students can use to advance in EPS career fields. During postsecondary interviews, frequently mentioned credentials included Certified Hazardous Waste Materials Manager, First Responder, Forestry, Professional Environmental Manager, Professional Wetlands Scientist and Sustainability Certificates. Local business leaders and conservation groups can validate and add to the list.

Consider posing the following questions to focus design team discussions:

- Which credentials can be earned at the secondary level and will help students enroll in postsecondary studies and/or secure entry-level employment?
- Which credentials are required to secure employment in high-skill, in-demand jobs and progress through their chosen career pathways?

Use the following five criteria to filter potential credentials and safeguard credential quality:

- The third-party developer of the credential, licensure or certification exam provides a detailed exam blueprint that shows how the credential aligns with state and/or national academic, technical and workplace standards.
- The credential, licensure or certification exam constitutes an appropriate end-of-program assessment for a high school student who has completed a three- to four-course career pathway program of study.
- The credential, licensure or certification exam has a credible link to high-demand industries and high-wage jobs that pay a self-sustaining wage of \$35,000 or more for individuals in the state or region.
- The credential, licensure or certification exam has a credible link to related postsecondary certificates, credentials and/or degree programs offered by state two- and four-year institutions or formal apprenticeship programs.

Recommendation 3: Build a full spectrum of EPS-related work-based learning activities.

Work with design team partners and additional postsecondary and business partners to identify work-based learning activities that give students opportunities to engage with EPS leaders and gain an understanding of how problems are explored and solved in EPS careers. The spectrum of work-based learning begins with interacting with EPS leaders to develop solutions for project-based learning assignments, learning from guest speakers, showcasing EPS-related solutions and going on local business tours. Work-based learning activities should expand to include formal job shadowing activities, practicums, paid or unpaid internships, co-ops and apprenticeships. Hands-on workplace experiences help students learn many of the employability and occupational skills that are valued in the field.

Ultimately, work-based learning activities should provide students with an opportunity to see EPS careers in real workplaces. While EPS-related pathways are being developed, work with local postsecondary campuses to expose students to EPS-related careers. Determine how postsecondary instructors and program leaders can serve as face-to-face or virtual guest speakers. Identify postsecondary campuses with research centers, such as [Southeastern Louisiana University's Turtle Cove Environmental Research Station](#), that can provide outreach experiences that expose students to EPS research and solutions.

The EPS pathway design team can lay the groundwork to implement strategies that build, scale and sustain strategic partnerships for work-based learning.

Recommendation 4: Develop a strategic plan and resources to expose students to EPS-related careers and educate students and families about EPS pathway course sequences and related postsecondary programs and credentials of value.

EPS-related jobs are available across the state, with many current and projected openings that are accessible to high school graduates.

Use the labor market findings provided in Appendix A to create career awareness activities for middle grades and high school students. Review the [Quest for Success](#) course to determine how to showcase EPS-related careers. QFS is an innovative high school career exploration course that prepares all Louisiana graduates for career and life success. At a minimum, provide a list of careers and related postsecondary programs when discussing Unit 7 — Navigating My Career Path, which allows students to explore careers across different career sectors and develop an individual graduation plan and early career plan.

As the design team solidifies course sequences and identifies related postsecondary programs and industry-recognized credentials, the team should also begin creating visuals, print resources and digital media that introduce students, families and the community to each pathway. Although these materials will evolve over time as EPS pathway programs grow, they should be used as a starting point for K-12 career awareness and development activities.

Recommendation 5: Identify a structured system for conducting ongoing evaluations of EPS pathways.

Work with the design team and a cross section of the Louisiana Science, Technology, Engineering, and Mathematics Advisory Council Committee to review proposed pathway outlines and content. Use the LaSTEM Committee as an “outside set of eyes” to review proposed course sequences and content, provide feedback and ensure that each proposed pathway meets the same expectations as other state STEM pathways. Have the design team and LaSTEM Committee identify progress measures to collect during the initial implementation year and revisit annually to determine program strengths and opportunities for improvement. The design team should:

- Define desired system, program and participant outcomes.
- Identify the data needed to measure system, program and participant outcomes.
- Implement a process to collect, store, track, share and analyze data.
- Design and implement a plan for reporting system and program outcomes.

Conclusion

SREB commends the Louisiana Department of Education for its vision and leadership in developing career pathways that align with postsecondary and workplace opportunities. In addition to sponsoring this study, LADOE worked to refine the state’s Jumpstart Pathways and expansion of STEM-related pathways. Louisiana’s recent efforts have created opportunities for more students to graduate with industry-recognized credentials and make seamless transitions to related postsecondary programs and careers.